The Council is supported by a Standing Committee, consisting of the Director-General of the Forestry and Timber Bureau, the heads of each of the six State Forest Services, the Chief of the Division of Forest Products, C.S.I.R.O., the Secretary of the Department of the Interior and the Secretary of the Department of External Territories.

Fire protection

The provision of adequate fire protection is one of the main problems facing forest and rural authorities. The commercial forest area is estimated at 37 million acres with a further 39 million acres of forest not at present exploitable. The forest services maintain a high degree of protection over a relatively accessible area of about 23 million acres, about 17 million acres in the more inaccessible area receive a lesser degree of protection, and about 8 million acres are at present not protected. The remaining area of 28 million acres is mainly vacant Crown Land or is privately owned or leased, and under some degree of fire protection from the rural volunteer fire-fighting organisations or Government-financed fire protection associations.

During the 1967–68 fire season a total of 1,754 fires were recorded over the area of 40 million acres of forest land afforded either intensive or extensive protection. An area of 754,000 acres was burnt by these fires, which represents 1.9 per cent of the area protected. This is the fifth largest area of forest land burnt over the last twelve years.

A large proportion of this burnt area was located in Victoria and southern New South Wales where particularly severe drought conditions prevailed throughout most of the summer and autumn period. The drought index exceeded a value of 700 on a scale of (0–800) over most of the forest land at higher elevations in the Australian Alps and was one of the severest droughts experienced in this region for over 100 years. Although large areas of forested land were in a state of extreme dryness, the absence of strong dry continental winds prevented severe 'blow-up' conditions, which result in extreme fire danger, except on a few isolated days.

The number of forest fires and the forest area burnt over the last twelve years is shown in the following table.

NUMBER OF FIRES AND FOREST AREA BURNT, 1956-57 TO 1967-68

	Protected forest areas (a)		
Year	*Number of fires*	*Forest area burnt*	*Percentage of forest area burnt*
		'000 acres	
1956–57	1,999	344	0.9
1957–58	2,908	2,078	5.2
1958–59	1,175	456	1.1
1959–60	1,504	1,314	3.3
1960–61	2,667	1,294	3.5
1961–62	1,761	297	0.8
1962–63	1,299	275	0.7
1963–64	1,494	549	1.5
1964–65	2,307	1,626	4.1
1965–66	1,865	465	1.2
1966–67	1,422	388	1.0
1967–68	1,754	754	1.9

(*a*) The area receiving protection has been taken as the 40 million acres for which State forest services provide protection.

Although drought conditions were not particularly severe along the coastal area of New South Wales and Queensland during the summer and autumn months of 1968, drought breaking rains which occurred over Victoria and southern New South Wales during May 1968 did not extend to the coast. Drought conditions thus prevailed during the winter months and intensified during the spring. Widespread fires occurred along the entire eastern seaboard from September onwards and an area of around 5 million acres of forested land was burnt in Queensland and New South Wales.

Very intensive fire protection is afforded to the coniferous plantation area of Australia. This area is increasing rapidly and the annual planting programme is now between 60,000 and 70,000 acres. During the 1967–68 fire season a total of 288 acres were burnt, representing 0.04 per cent of the area of 729,928 acres for which fire statistics are available. This was the smallest area of coniferous plantation burnt during the last twelve years.

The area of coniferous plantations burnt during the past twelve years is shown in the following table.

CONIFEROUS PLANTATIONS: AREA BURNT AND TOTAL AREA, 1956-57 TO 1967-68

Year	Area burnt	Area of coniferous plantations	Percentage of coniferous area burnt
	acres	acres(a)	
1956–57	1,317	360,000	0.37
1957–58	1,339	386,000	0.35
1958–59	1,594	402,000	0.40
1959–60	329	435,000	0.07
1960–61	507	452,000	0.11
1961–62	598	472,000	0.13
1962–63	475	492,000	0.10
1963–64	418	515,000	0.06
1964–65	3,130	556,000	0.56
1965–66	1,520	610,000	0.25
1966–67	461	660,835	0.07
1967–68	288	729,928	0.04

(a) This area does not include some 81,000 acres of privately owned coniferous forest for which fire statistics are not available.

Protection of private property outside urban areas is undertaken by volunteer bush fire brigade organisations which are co-ordinated in each State by a committee or board carrying out functions of an advisory or educational nature and fostering the growth and organisation of the bush fire brigade movement. Throughout the main agricultural and forest areas of Australia there are over 5,000 registered volunteer bush fire brigades with a membership approaching 300,000. Although forest and rural fire organisations are entirely separate entities, a high degree of co-operation and liaison is maintained.

In addition to the forest service and rural organisations, various private and semi-governmental bodies in each State maintain fire protection organisations, which are generally concerned with the protection of private forestry operations and hydro-electric and water catchment areas.

Over the five-year period 1964 to 1968 the annual cost of protecting from fire the 40 million acres of forest land for which State forest services, semi-governmental bodies and private companies provide protection is estimated at $6,000,000 or about 15 cents an acre. The cost of rural fire control as a whole cannot be estimated with any degree of accuracy because by far the greatest contribution comes from the personal efforts of volunteer brigade members.

The Australian fire season is very variable, especially in the eastern and southern States. On the average, damaging fires can occur over a period of four months in all climatic zones. Occasionally this occurrence can extend one month either side of the main fire period. Individual fire seasons are generally of much shorter duration than four months, and the severity of a season is judged more on the number of 'blow-up' days of extreme fire danger than on its length. On the average, four years in ten are classified as of average severity and two years in ten as severe, the remaining four years being of below-average severity. During severe seasons in the past as much as 15 per cent of the protected forest area has been burnt. However, with improving fire control services, it can be expected that the area burnt in severe fire seasons will in future be significantly reduced.

Intensive research work is being carried out on bushfire problems and both Commonwealth and State agencies maintain active research groups.

Research into the factors affecting fire behaviour has resulted in improved fire fighting techniques and safety on the fireline. In addition, research in this field has led to a greater knowledge of the effect of controlled burning on resource values and has permitted precise prescriptions to be laid down so that the work of hazard removal in forested country can be carried out more expeditiously and with greater safety.

Recent developments of techniques of aerial control burning have greatly reduced costs and permit larger areas to be burnt during favourable weather conditions. Small incendiary capsules are dropped from fixed wing aircraft or helicopters on a predetermined grid pattern at a rate of one incendiary every 5 or 10 acres (*see* Plate 46) and the resulting fires burn together slowly and remove excessive accumulations of fuel which have built up in the absence of fire. These very low intensity fires have low flame heights and seldom scorch the leaves on the standing forest trees. The cost of this type of control burning is around 4–5 cents per acre and one aircraft can cover an area of 15,000–20,000 acres in an afternoon. Care is taken to confine the fires within the area specified for treatment.

This technique of aerial control burning is unique to Australia and all the associated equipment and the incendiary capsule were developed by Australian fire research groups.

Control burning of forested country is one positive way in which damage from wildfires can be reduced. During 1968 an area of some 2 million acres was control burnt and of this area over 50 per cent was burnt by aerial ignition techniques (*see* Plate 46). During 1969 it is expected the area will increase to around 2½ million acres.

Research is continuing into the use of water bombing aircraft for the suppression of fires caused by lightning which occur in remote forested areas not readily accessible to conventional ground suppression forces. The Victorian Forests Commission now has an aerial attack system in operational practice and the use of light agricultural aircraft in this role is extending to other States. A programme of evaluation of all agricultural aircraft available for use in aerial fire suppression has been recommended by the Australian Forestry Council and is being carried out by the Forestry and Timber Bureau of the Department of National Development.

A special infra-red fire detector has been recently developed in Australia which will permit the location and mapping of bushfires through heavy continuous smoke. It will be especially valuable in picking up spotfires which may have been thrown long distances ahead of a bushfire and which are normally obscured by the heavy smoke pall. This latest equipment covers a range of wavelengths from 1–15 microns and can be operated from light aircraft.

Since fire prevention is one of the most important aspects of the problem, intensive campaigns are being conducted to reduce the incidence of man-caused fires. A study of fire causes in recent years reveals that human agencies account for about 90 per cent of all fires, and of this figure at least 80 per cent are preventable. It is estimated that 'burning-off' (much of which is started illegally) accounts for 30 per cent of all fires. Lightning accounts for a little over 10 per cent of all fires in Australia, although the incidence of fires caused by lightning is much higher in certain areas, especially the southern highlands regions in New South Wales and Victoria. Although lightning is a relatively small numerical cause of fire, the percentage area burnt from this cause is estimated at about 20 per cent. This higher figure is due to the occurrence of multiple fire outbreaks which cause fire fighting difficulties, and to the inaccessibility of the areas in which such fires generally occur.

An increasing number of fires are starting from roadsides, and smoking materials account for a high proportion of these fires. The fire proofing of roadsides by chemical and mechanical means should reduce this incidence, which has accounted for over 25 per cent of all fires in some regions.

The damage resulting from bushfires in Australia is difficult to estimate. Eucalypts, which comprise the main forest species are seldom killed by fire, and damage estimates frequently involve the complicated question of loss of increment and degradation of timber quality. It may be conservatively estimated that damage to forest values lies between $2 and $4 per acre burnt per year and that over the last ten years the average value of forest fire damage is of the order of $4 million a year. In very severe fire seasons such as 1925–26, 1938–39 and 1951–52, which affected large areas of the continent, fire losses may have been as high as $200 million. The monetary damage resulting from the Tasmanian bushfires of 7 February 1967 was estimated at $40 million over the 640,000 acres burnt in Tasmania. These fires involved heavy housing losses in the city of Hobart and surrounding townships.

Commonwealth loans to expand softwood plantations

In February 1965 the Australian Forestry Council recommended that the rate of expansion of softwood timber planting in Australia should be increased from their existing level of about 40,000 acres a year to 75,000 acres a year for the next thirty-five years. The recommendations envisaged a phased increase in the rate of Government plantings by the various State Governments up to a level of some 65,000 acres per annum, and an average of at least 10,000 acres per annum by private forest owners. This programme would make a major contribution towards meeting Australia's future requirements for softwood products.

In February 1966 the Commonwealth Government endorsed this recommendation and agreed, as a first step towards achieving the proposed annual target of 75,000 acres, to provide financial assistance to each State, over a five-year period commencing 1 July 1966, to enable them to accelerate their rate of softwood plantings. The assistance, which will be provided to the States under section 96 of the Constitution, will take the form of long-term loans repayable over twenty-five years with repayments of principal and the payment of interest to commence ten years after the date of each advance. The *Softwood Forestry Agreements Act* 1967 authorised the Commonwealth to enter into agreements with each of the States to provide financial assistance by way of loans during the financial years 1966–67 to 1970–71 inclusive. Payments under the Act by the Commonwealth to all States in 1966–67 amounted to $291,000, in 1967–68 to $3,456,000, and in 1968–69 to $3,872,000. It is estimated that $4,879,000 will be provided in 1969–70.

Employment in forestry

Persons engaged in forestry activities, 1966 census

The number of persons whose industry statements were classified to 'forestry' (excluding sawmilling) at the 1966 population census was 13,492 out of a total of 512,994 in all primary industries and 4,856,455 in the total work force. For further information *see* the chapter Employment and Unemployment, also 1966 Census Bulletin No. 9.6, *Population: by Industry and Occupational Status, Australia.*